mesis following appendicitis. He believes in the absence of any macroscopic changes in the gastric mucosa that peritonitis was the cause.

The author reports a case occurring in a man sixty-two years of age who had a typical attack of appendicitis. Upon the second day he vomited a large quantity of coffee-ground material which gave the chemical reactions of blood. The patient died upon the fourth day of the disease. The autopsy showed a gangrenous appendix lying in a not well walled off intraperitoneal abscess cavity. The veins in the mesentery and omentum were not thrombosed. The jejunum and stomach were filled with a blackish fluid. In the mucous membrane of the fundus and greater curvature there were innumerable flat pinhead-sized ulcers covered in part by blood-clots. There were evidences of a diffuse septic peritonitis.

In view of the fact that the autopsy was performed three hours after death, the gastric ulcerations could not be considered as due to post-mortem digestion. Microscopically, the ulcerations were seen to involve the mucosa and submucosa. In one vein of the submucosa a fresh thrombus was found. There were also many areas of necrosis near the open ends of the glands, and at these points ulcers had formed.

Hæmorrhage takes place from these many small ulcers, and the cause of the latter is undoubtedly a toxic one. The glands of the stomach take up the poison, and in excreting it become necrotic and ulcers form. The toxins reach the stomach from the septic peritonitis either through the general circulation or in a retrograde manner through the veins, especially of the omentum.—*Deutsche Zeitschrift für Chirurgie,* Band lxiv.

DANIEL N. EISENDRATH (Chicago).

GENITO-URINARY ORGANS.

I. **Injuries of the Kidney.** By DR. WALDVOGEL. The author has collected twenty-three cases occurring between 1895

and 1900 in the Charité Clinic of Professor König. In eleven cases a fall was the cause of injury. In seven the patients had been run over. He thinks that the theory of Küster, of hydraulic pressure action of the fluids within the kidney upon its parenchyma, will not hold for all cases. In many the tear is the result of the force crushing the kidney directly either from in front or from behind. Sudden violent muscular contractions are also a factor.

Hæmaturia is the most reliable symptom. It may only be present in the form of a few red cells. Albuminuria may appear without blood from a trace upward. Casts may also be present with or without blood. The blood may be carried off through the ureters, collect around the organ (perirenal hæmatoma), or escape through a tear into the general peritoneal cavity. Perirenal collections occurred in about half of the cases. In three there was accompanying intraperitoneal hæmorrhage. In one it occurred as the latter alone.

Three of the twenty-three cases, or 13 per cent., died. They were operated upon during collapse. One had intraperitoneal hæmorrhage, a second also had a rupture of the liver. He advises conservative treatment in all cases. The extreme anæmia present in some may be due to injuries of other viscera, hence laparotomy with König's incision is advised. This permits exploration of the abdomen and, if necessary, tamponade of the kidney. The latter can often replace nephrectomy. Gunshot wounds should be treated in the same manner.—*Deutsche Zeitschrift für Chirurgie,* Band lxiv.

DANIEL N. EISENDRATH (Chicago).

II. Kryoscopy in the Diagnosis of Nephritis and the Prognosis of Nephrectomy. By DR. H. KÜMMELL (Hamburg). In 265 cases where the freezing point of the blood was established, the renal function was normal 137 times. The normal freezing

point of the blood (δ) is 0.56. Variations between 0.57 and 0.54 are physiological.

In the 137 cases of normal renal function, the blood freezing point (the sign of this is δ) was fifteen times 0.57, eleven times 0.55, and twice 0.54. The examinations were made on patients suffering from cystitis, pyelitis, very varied surgical diseases, and fevers, such as typhoid.

In fifty-one cases of unilateral renal disease, δ was once 0.56, three times 0.57, twice 0.55.

In seventy-seven cases of renal insufficiency, δ was varied from 0.58 to 0.81. The majority of the cases showed $\delta = 0.60$.

These figures establish the kryoscopic indications for and against nephrectomy. When δ is 0.58 or 0.59, renal sufficiency is incomplete, but yet nephrectomy may be performed without too great danger. The one kidney, while not entirely healthy, is yet capable of performing the duties of its excised fellow. When δ is more than 0.59, nephrectomy is contraindicated.

In 170 operations on the kidneys and ureters, δ was established prior to operation fifty times. In all these cases the correctness of the kryoscopic data was established by the results of the operations, or in a few cases by the abduction. (Of course, in all these cases the urine from each separate kidney was thoroughly examined.) Although we can by finding δ (*i.e.*, the freezing point of the blood) establish the presence of a kidney capable of sufficient function, yet this does not tell us which kidney is healthy, or if both kidneys are partially diseased. For this purpose, ureter catheterization and examination of the separate urines, chemically and thermometrically, is necessary.

Analysis of the fifty cases in which the freezing point of the blood (δ) was established before operation—six cases of hydro-nephrosis—all recovered. $\delta = 0.56$ in one case and 0.57 in five cases.

In one case $\delta = 0.60$; nephrotomy was performed. The freezing point afterwards became 0.58 and the diseased organ was removed. Recovery.

Fifteen cases of pyonephrosis. In ten, $\delta = 0.56 — 0.57$; in two, $\delta = 0.58$; in one, $\delta = 0.59$; in three, $\delta = 0.60 — 0.65$.

Of these cases thirteen recovered and two died, one from pulmonary embolism, the other from progressive renal suppuration —perforation of diaphragm, empyema, and pulmonary œdema; post-mortem examination showed that the other kidney, from which the urine had given $\delta = 0.56$, was healthy and compensatorily hypertrophied.

In a patient whose δ was 0.59, convalescence was disturbed by insufficient excretion of urine, albuminuria, and collapse. There was slow but complete recovery.

Of the three patients whose δ was 0.60 and lower, in two the kidney was split open and pus evacuated; δ rose to normal, and they recovered.

Among thirteen cases of renal calculus, two were double and had complete anuria; both recovered. One with double closure of the ureters, already gravely uræmic when seen, died. In the former two cases δ was 0.63 and 0.65 before operation, and became normal after. In one case of nephritis and calculus combined $\delta = 0.60$. After removal of the stone, the albumen lessened and δ became normal. In the remaining ten cases δ was 0.56 nine times and once 0.58.

Fourteen cases of renal tuberculosis. In eleven, $\delta = 0.56—0.57$; in one, $\delta = 0.54$; in one, $\delta = 0.55$; in one, $\delta = 0.60$.

In the last case there was disease of both kidneys, which were incised, pus evacuated. The patient died eight weeks later. In the other thirteen cases the disease was one-sided, the affected organ was removed, and recovery ensued.

In two cases of renal tuberculosis, δ was 0.63 and 0.64. The disease was bilateral, and operation was refused because of renal insufficiency.

The correctness of this determination was proved post-mortem.

The importance of determining the freezing point of the

blood and of the segregated urine is specially apparent in tuberculosis, as a very badly diseased organ may be removed while its fellow is not intact. By these two methods of diagnosis one can estimate whether or not the second kidney is capable of doing the work of both.

In two cases of renal tumor δ was 0.69 and 0.66. In the former there was bilateral cystic disease. The patient when seen was uræmic. On the assumption that there was bilateral calculous disease, the organs were incised. At the post-mortem no secreting tissue could be found.

In the second case ($\delta = 0.60$) there was suprarenal struma with nephritis. Compensatory hypertrophy of the opposite kidney gradually raised δ to normal. The disease was extirpated. Recovery.

In two cases with normal blood freezing point unilateral tuberculous renal disease was found and the organs removed. Recovery. Death after a long time from pulmonary disease and from cirrhotic liver. The obduction in each case showed the remaining kidney healthy. When the freezing point of the blood (δ) is 0.60, nephrectomy is contraindicated. Under such circumstances, if the disease is unilateral, one should wait until the healthy organ successfully undertakes the work of both, or the diseased organ may be split open and drained. If the disease is bilateral, only nephrotomy must be thought of, or complete abstention from operation. Where there is bilateral closure of the ureters, the stones must be removed, and if things progress favorably the freezing point soon becomes normal.

Comparison of the freezing point of the urine obtained from the two kidneys separately permits an approximate estimation as to whether a large or small portion of renal tissue is destroyed. This information aids the surgeon in deciding whether a conservative or radical operation is preferable.

The author thinks that the estimation of the functional activity of the kidneys by the means alluded to should be a constant

preliminary to any operative interference in those cases of nephritis which have been until recently in the domain of internal medicine.

Two conditions in particular lead patients with renal disease to consult the surgeon, viz., pain and hæmorrhage. A pain which may be dull and continuous or periodic, increasing to colic, is much more common in nephritis than is usually admitted. In such cases ureteral catheterization and determination of the freezing point (both of blood and each sample of urine, J. F. B.) will easily establish the presence of nephritis.

The significance of hæmorrhage has recently been much ventilated. Is there such a thing as renal bleeding without any pathologico-anatomic change, *i.e.,* an angioneurotic form, or are nephritic changes the cause of the bleeding On examination of the published cases, the author agrees with Israel in the opinion that up to this time only those of Schede and Klemperer deserve to be considered as cases of hæmorrhage without recognizable cause.

Is there such a condition as unilateral nephritis? The author, after much research, cannot admit that such is the case.

If we find in the urine from one kidney, albumen, tube casts, blood, while the urine from the other organ remains normal, then we can, with great probability, diagnose some other disease, *e.g.,* stone, tumor, etc., causing inflammation of the otherwise healthy kidney tissue.

The author points out the possibility of error in the cases of nephritis operated on by Edebohl and others, since there is no evidence that they used the diagnostic means advocated by him, and which he considers of supreme importance for a correct appreciation of renal conditions.—*Verhandlungen der deutschen Gesellschaft für Chirurgie,* 1902; *Centralblatt für Chirurgie,* 1902, No. 26.

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